

REMARKS

Summary of the Office Action

Claims 1 and 7 stand rejected under 35 U.S.C. §102(b) as being anticipated by Hawke et al. (US 5,528,457).

Claims 1, 3, and 5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Suzuki (US 5,510,956) in view of Hawke et al.

Claims 1, 3-5, 7, and 8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Wang et al. (US 5,977,626) in view of Hawke et al.

Applicant wishes to thank the Examiner for the indication that claim 6 contains allowable subject matter.

Summary of the Response to the Office Action

Applicant amends claim 6 to incorporate the features of independent claim 1, and cancels claim 8 without prejudice or disclaimer. Accordingly, claims 1, 2 and 4-7 are currently pending with claim 6 being placed into condition for allowance.

All Claims Define Allowable Subject Matter

Claims 1 and 7 stand rejected under 35 U.S.C. §102(b) as being anticipated by Hawke et al. (US 5,528,457), claims 1, 3, and 5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Suzuki (US 5,510,956) in view of Hawke et al., and claims 1, 3-5, 7, and 8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Wang et al. (US 5,977,626) in view of Hawke et al. Applicant respectfully traverses these rejections as being based upon references that neither teach nor suggest the novel combination of features recited by independent claim 1, and hence dependent claims 2, 3, 5, and 7.

Independent claim 1 recites a high-density chip scale package including, in part, “a heat sink mounted on the die for radiating heat from the die.” In contrast to Applicant’s claimed invention, Hawke et al. explicitly discloses, in FIG. 3, for example, various components 34 mounted onto a printed circuit board 32 with a heatsink 40 bonded to the printed circuit board 32 via an encapsulant material 36. However, although Hawke et al. discloses (col. 2, lines 64-67), with respect to the Prior Art FIGs. 1 and 2, that electronic components 14 can include capacitors, resistors, and semiconductor microchips, Applicant respectfully asserts that the schematic representations shown in FIG. 3 do not show a heat sink mounted on a die. Specifically, Applicant respectfully asserts that the components shown in FIG. 3 are physical representations of capacitors (shown as contacting both the printed circuit board 32 and the heatsink 40) and resistors and microchips (shown as relatively smaller “boxes” only contacting the printed circuit board). Accordingly, Applicant respectfully asserts that Hawke et al. fails to teach or suggest “a heat sink mounted on the die for radiating heat from the die,” as required by independent claim 1.

With regard to Suzuki, Applicant respectfully asserts that the heatsink 20 disclosed by Suzuki is mounted on the metal enclosure 19 and not on the die 14. Furthermore, although Applicant appreciates the Office Action’s interpretation of the word “on” and the fact that the broadest reasonable interpretation of the word “on” would not necessarily preclude other materials from being present between the die and heatsink, Applicant respectfully asserts that one of ordinary skill in the art would not consider Suzuki to teach or suggest “a heat sink *mounted on* the die for radiating heat from the die,” as required by independent claim 1.

With regard to Wang et al., Applicant respectfully asserts that Wang et al. is completely silent with regard to placement of the molding material 30 within the cavity formed by the heat spreader 32, the substrate 20 and the die 22. Accordingly, Applicant respectfully asserts that Wang et al. fails to teach or suggest “a liquid encapsulant filled between the printed circuit board and the heat sink,” as required by independent claim 1. Moreover, Applicant respectfully asserts that neither Hawke et al. nor Suzuki remedy the deficiencies of Wang et al.

In view of the above, Applicant respectfully asserts that none of Hawke et al., Suzuki, and/or Wang et al., whether taken single or combined, teach or suggest the combination of features recited by independent claim 1, and hence dependent claims 2 , 4, 5, and 7.

Conclusion

In view of the foregoing, withdrawal of the rejections and allowance of the pending claims are earnestly solicited. Should there remain any questions or comments regarding this response or the application in general, the Examiner is urged to contact the undersigned at the number listed below.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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Dated: June 23, 2005

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